MARKET FOR HARDWARE BASED COMPUTER PERFORMANCE MEASUREMENT MONITORS IN THE UNITED STATES

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MARKET FOR HARDWARE BASED COMPUTER PERFORMANCE MEASUREMENT MONITORS IN THE UNITED STATES

Prepared For:
TESDATA, INC.

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JUNE 1981

MARKET FOR HARDWARE BASED COMPUTER PERFORMANCE MEASUREMENT MONITORS IN THE UNITED STATES

ABSTRACT

A survey was conducted with users and non-users of computer performance measurement monitors in order to determine the U.S. market potential and product requirements for hardware based monitors for the period 1981-1985.

Interviews were done with a wide range of industry and U.S. Government sectors. Parameters surveyed included future EDP budgets and performance measurement expenditures; justification for purchasing monitors, distributed data processing and data communication trends, and satisfaction levels of current users of hardware and software based monitors.

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JUNE 1981

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1 INTRODUCTION

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I. INTRODUCTION

A. PURPOSE AND SCOPE

- This report was prepared by INPUT as a custom study for Tesdata, Inc. located in McLean, VA.

- The purpose of the study was to investigate the U.S. market potential and product requirements for hardware based monitors for the period 1981-1985.

- During the program interviews, Tesdata was not identified as the study sponsor.

- The respondents in general were helpful and cooperative during the telephone and on-site interviews, although several candidates refused to be interviewed for company policy reasons. In some cases several people within the same department had to be interviewed in order to obtain information on departmental and performance measurement budgets.

- Parameters surveyed included:

  - Existing computer system configuration.

  - DDP and data communication trends.

  - Organizational relationship of data communication and data processing groups.

  - Uses of performance measurement monitors.

  - Justification for purchasing hardware and software based monitors.

- Satisfaction in usage of monitors.

- Strengths and weaknesses of hardware versus software monitors.

- Staffing and organization of performance measurement and data communication departments.

- EDP and performance measurement group future expenditures.

- Allocation of present and future performance measurement budget.

- Product development needs and expectations.

B. OBJECTIVES

- 1981-1985 market forecasts.

- Market attitudes and plans.

  - Tesdata customers.

  - Prospective clients.

  - Negative prospects.

  - Federal government users.

- Market trends.

  - Large Single Mainframe Monitors.

  - Peripheral Monitors.

- Communication Monitors

- MP/DDP Monitors.

- Monitor purchasing criteria.

  - EDP systems group.

  - Data communications group.

- Product requirements desired by end users.

C. METHODOLOGY

- Fifty (50) interviews - telephone and on-site as shown in Exhibit I-1.

  - Nationwide.

  - Wide size range and type of private and public sector companies and organizations interviewed.

  - Senior System Analysts to Vice President Computer Planning interviewed.

- Sixteen percent (16%) of data processing systems, 10% of data communications, and 0% of non-user respondents were interviewed in a similar study performed for Tesdata in 1977.

- Interview candidates were selected by INPUT from the following source directories:

- EDP systems respondent candidates were selected from the Directory of Top Computer Executives, published by Applied Computer Research, Spring 1980 edition.

- Data communications respondents were selected from The Directory of Communications Management, published by Applied Computer Research, Summer 1980 edition.

- Federal Government and Department of Defense candidates were obtained from a special respondent candidate list generated by Computer Intelligence Corporation, located in San Diego, California.

- The average telephone interview lasted from 20 minutes to 45 minutes.

- A final presentation was made in McLean, VA on May 12, 1981 to eight officers and managers of the Tesdata Company.

- The identity of the respondents remains anonymous with respect to the results obtained in the surveys.

EXHIBIT I-1

RESPONDENT PROFILE
(NUMBER OF INTERVIEWS)

USER TYPE / INDUSTRY / GOVERNMENT CATEGORY	DP SYSTEMS	DATA COMMUNI-CATIONS	NON-USERS	TOTALS
BANKING	3	4	0	7
INSURANCE	2	1	0	3
UTILITIES	1	1	0	2
TRANSPORTATION	1	0	0	1
COMMUNICATION	3	1	2	6
DP SERVICES	1	1	1	3
HOSPITALS	1	0	0	1
CONSULTANTS	0	0	1	1
STOCK BROKERAGE		1	0	1
FORTUNE 1000 MANUFACTURING	6	2	0	8
NON-FORTUNE MANUFACTURING	2	2	3	7
FEDERAL GOVERNMENT	1	1	0	2
DEPT. OF DEFENSE	5	3	0	8
TOTALS	26	17	7	50

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II EXECUTIVE SUMMARY

II. EXECUTIVE SUMMARY

A. CONCLUSIONS

1. MARKET SIZE

- The potential total annual expenditures by computer users for hardware based performance measuring systems are estimated to be $112 million in 1981 and approximately $200 million in 1985.

  - These figures are based on a total domestic base of 4,000 major computer installations (370/155 or larger), each spending a total of $41,000 for hardware monitors in 1981 and $73,000 in 1985. The product of these numbers is factored by a 68% "high probability of buying" within the next four years.

  - In other words, if those 68% of computer installations spent, for hardware monitors, the same amount of money that the average user spends today, the market size would be $112 million today and $200 million in 1985.

- In fact, only about 25% of that market potential is currently reached in the form of actual buyers for a penetrated market of about $27 million.

- The federal government fraction of that market potential is estimated to be between 8 and 10% of the total or about $10 million in 1981 and a similar percentage or $20 million in 1985.

- This estimate of the federal market is much less accurate than that for the overall market due to the narrowness of the federal market sample (ten respondents).

- The size of the monitor market for DDP systems is impossible to estimate from this study.

  - This is because:

    . The actual operating budgets for DDP are themselves distributed and often not clearly understood or projectable by the respondents to this survey.

    . The respondents do not know how they could, much less would, conduct performance measurements on a DDP system.

  - There are indications, however, that the budgets available for DDP performance measurements will be significantly less, as a fraction of total DP expenditures, than is the case for mainframes and data communication systems. This is attributable to the budget being in the control of less sophisticated DP personnel.

- Users' estimates and expectations of the allocation of PM expenditures follow a relatively clear pattern.

  - Hardware expenditures are expected to retain a constant 24% share of the total.

  - Software expenditures are expected to decline from the current 40% to 19% in 1985.

  - Personnel expenditures, currently 36% of the total, will rise to 57%.

- Total expenditures for PM by current users are expected to increase at a steady 15% from a current installation average of $172,000 annually to $306,000 in 1985.

- Combining these allocations with the total user PM expenditures gives the following figures (in thousands of dollars of annual expenditures) for the average PM user.

	1981	1985	AAGR
HARDWARE	$ 41	$ 73	15%
SOFTWARE	$ 69	$ 58	-4%
PEOPLE	$ 62	$175	30%
TOTAL	$172	$306	15%

2. USER QUALIFICATIONS

- Prospect qualification for the purchase of hardware monitoring systems is not closely correlated to DP system size. Among the respondents there were many non-users with very large systems who were not evaluated as potential prospects for a variety of reasons--mostly people related, not system related.

- Non-IBM systems (Burroughs, Honeywell, CDC, etc.) appear to be strong users of hardware monitors due to the lack of monitoring software.

- The federal government segment in particular has a much higher percentage of non-IBM systems and is, therefore, more amenable to the use of hardware monitors.

- A key point found throughout this study is the need for the participation of a senior and knowledgeable DP manager in both the PM procurement as well as results utilization. The existence of and ability to involve such an individual is the primary prospect qualifier.

3. USER ATTITUDES

- The attitude of users varied directly in proportion to their actual use of the PM system.

  - Often a system was idle or ineffectively used and the user attitude (user here implies top DP management) was either "Never again" or "That money was wasted by my predecessor."

- In other words, usage begets familiarity, which begets user satisfaction.

- Some of the most sophisticated and, therefore, most satisfied users of PM systems have gone well beyond the hardware and software offerings of their vendors by combining the offerings and building measuring systems of their own.

- In most of the situations observed, the PM system was being used by technicians (senior system analysts) in a largely diagnostic mode rather than an analytical or planning mode.

4. DATA COMMUNICATIONS

- Performance control of data communication networks is becoming an important function in most organizations, particularly those such as banks where the data network is a revenue producer for the firm.

- At this point, most users are thinking of diagnostics for data communication only, but from other studies INPUT believes that planning and longer range control will become increasingly important in the future.

- Data communications management was an entirely separate organization from data processing management in all companies interviewed.

- Users' plans for the monitoring, control, and performance measurement of data communication systems were much more clear than with DDP systems.

5. PRICE SENSITIVITY

- Again, as with user attitude, price sensitivity is a function of the organization level of the respondent.

  - The peak price for technicians (senior system analysts, data communications managers) is in the $60,000 to $75,000 range, with most products being bought in the under $20,000 ranges.

  - DP management supported systems appear to have little trouble justifying PM systems in the range of up to 5% of mainframe prices and, in a few cases, 10%.

- The price sensitivity for data communication products is usually at a much lower level.

- As noted earlier, the price sensitivity for DDP monitors is not measurable.

- Generally, one of the key attractions of software monitors for most PM users is their low price. These systems do a less accurate and less detailed but adequate job for most situations in the view of users.

6. PRODUCT ENHANCEMENTS

- The requirement expressed by users was for more intelligible and broader based reports. Specifically this meant:

  - Less detail.

  - More interrelationship with software measurements.

  - More "actionable" outputs.

  - More management understandable reports.

7. MARKET DEVELOPMENT

- A key conclusion which INPUT has developed from this study is that the performance monitor market has been developed as a technical aid to technically trained people and not as a tool for DP management.

  - The use of the tool ceases when the technician leaves.

  - The use of the tool is primarily diagnostic.

  - The product sales literature is oriented toward the technicians.

- DP management is itself becoming much more attuned to the requirements of the firm. DP performance measurement must also.

B. INPUT RECOMMENDATIONS

- Take a combined hardware and software (systems) approach in monitoring data processing systems and data communications networks.

- Sales development programs must be targeted to top management as well as to technician level personnel. ("Technician" in this context refers to the system analyst responsible for performance measurement.)

- High priced item being sold to technician. Difficult to justify purchase approval to top management.

- More "after sale" customer support and product implementation assistance required in:

  - Education.

  - "Hands-on" use.

- Applications.

- Data output interpretation.

- Establishing computer and data communication network "performance standards."

- Develop a professional services (consulting) organization which would investigate pre-sale and after-sale prospects and user needs and provide the vehicle for continuous education programs for monitor usage and applications development.

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III DETAILED FINDINGS

III. DETAILED FINDINGS

A. INTRODUCTION

- The exhibits in this section were presented to Tesdata in McLean, VA on May 12, 1981.

- The results of the interviews, with commentary, are summarized in the following exhibits.

B. MARKET FORECASTS

- From the sample of fifty interviews conducted an overall estimate is that 64% of these organizations will probably be customers for hardware monitors within the next five years.

  - Existing Tesdata customers were estimated at a lower percentage probability (50%) than other prospects (68%) due to the already high level of installed monitoring equipment at these sites.

- Market forecasts were difficult to obtain because, in most cases, middle level managers and technicians interviewed were not aware of current or future budget information for the EDP department or the performance measurement function.

- This necessitated a second interview, usually with a senior management person.

- Exhibits III-1, III-2, and III-4 provide the basis and methodology for the market forecasts as presented in Exhibit III-3. In addition, Exhibit III-3 outlines the assumptions for these market forecasts.

EXHIBIT III-1

RESPONDENT PROFILE VERSUS
TESDATA CUSTOMER STATUS

CUSTOMER STATUS / INDUSTRY / GOVERNMENT CATEGORY	OLD CUSTOMER	NEW * CUSTOMER	NEGATIVE** PROSPECT	PROSPECT***
BANKING			3	4
INSURANCE	1	1		1
UTILITIES			1	1
TRANSPORTATION				1
COMMUNICATION		1	2	3
DP SERVICES		2	1	
HOSPITALS				1
CONSULTANTS			1	
STOCK BROKERAGE				1
FORTUNE 1000 MANUFACTURING	1	1	3	3
NON-FORTUNE MANUFACTURING				7
FEDERAL GOVERNMENT		2		
DEPT. OF DEFENSE	1	2	1	4
TOTALS	3	9	12	26
PERCENT TOTALS	6%	18%	24%	52%

*NEW CUSTOMER IS A RESPONDENT WHO HAS BECOME A TESDATA CUSTOMER WITHIN THE LAST 12 MONTHS.

**NEGATIVE PROSPECT IS A RESPONDENT WHO STRONGLY INDICATED THAT BY CORPORATE PHILOSOPHY OR POLICY THEY WOULD NOT USE ANY HARDWARE BASED MONITORS IN THEIR ORGANIZATION; ALSO A PROSPECT WHO INDICATED THAT THEY WOULD NOT BUY A HARDWARE BASED MONITOR BECAUSE PRICES ARE TOO HIGH.

***ANY RESPONDENT WHO IS NOT A TESDATA CUSTOMER OR IS A NEGATIVE PROSPECT.

EXHIBIT III-2

COMMENTS ON RESPONDENT PROFILE VERSUS TESDATA CUSTOMER STATUS

- The name of each survey respondent was submitted to Tesdata to determine whether that company or government agency was an "old" customer or "new" customer of Tesdata.

- Exhibit III-1 represents this respondent segmentation. Negative prospects and viable prospects are defined in the footnote of that table.

EXHIBIT III-3

MARKET FORECASTS 1981-1985

Assumptions:

- Fifty percent (50%) of Tesdata "old" and "new" customers are prospects for additional Tesdata equipment.

- No other assumptions were made for the following forecasts.

ESTIMATED MARKET POTENTIAL FOR ONE OR MORE TESDATA PRODUCTS 1981-1985

- Thirty-six percent (36%) Fortune 1000.

- Fourteen percent (14%) non Fortune companies.

- Fourteen percent (14%) government/DOD.

- Sixty-four percent (64%) of all organizations interviewed.

*DOD = 12%

EXHIBIT III-4

MARKET FORECAST METHODOLOGY

- Respondents were classified to according industry and government categories as seen in Exhibit III-1.

- Forecasts were obtained by grouping respondents into three categories, namely Fortune 1000, Non-Fortune, and Government/DOD categories.

- By referring to Exhibit III-1 forecasts were obtained by counting the number of prospects falling into each of the three categories plus adding 50% of the "old" and "new" Tesdata respondents in each of those respective categories.

- Forecasts in percent were obtained by dividing the total number of these respondents by 50.

C. PERFORMANCE MEASUREMENT BUDGET AND ALLOCATION

- Performance measurement expenditures were obtained by adding the dollar expenditures anticipated by each data processing or data communications respondent and dividing that total dollar amount by the number of responses to that question.

- With reference to Exhibit III-6, respondents indicated that they would be willing to allocate some of their "people" expenditure budget to additional hardware/software monitors if more analytic and interpretive ability were available in these commercial products. (See Exhibits III-5 and III-6.)

D. MARKET ATTITUDES AND PLANS

- In general, most respondents indicated satisfaction with their existing hardware and software monitors primarily because no better ones were available in the market.

- Respondents' satisfaction level was such that, in general, they would purchase these monitors again.

- In general, most users of performance measurement monitors interviewed were looking for more powerful performance measurement tools with which to monitor their systems and data communications networks, as shown in Exhibit III-7.

EXHIBIT III-5

AVERAGE PERFORMANCE MEASUREMENT EXPENDITURES
PER RESPONDENT

1981	1985
$172,000	$306,000

EXHIBIT III-6

PERFORMANCE MEASUREMENT
BUDGET ALLOCATIONS

EXPENDITURE CATEGORY	PERCENTAGE OF PERFORMANCE MEASUREMENT BUDGET ALLOCATIONS		
	1981	1985	% CHANGE
HARDWARE	24%	24%	0%
SOFTWARE	40%	19%	-21%
PEOPLE	36%	57%	+21%
	100%	100%	

(PERCENT TOTAL PERFORMANCE MEASUREMENT BUDGET)

EXHIBIT III-7

MARKET ATTITUDES AND PLANS

- "Old" Tesdata customers:
  - Approximately 50% have become non-users/defunct users.
  - Some giving "fire test" to new MS 108/109 product line.
  - Others built own combined hardware and software proprietary monitors.
- "New" Tesdata customers:
  - Eager and enthusiastic about hardware monitors.
  - Anxious to make optimal use of hardware monitors.
- Prospects:
  - Looking with curiosity and interest at hardware based monitors.
- Negative prospects:
  - About 50% have corporate policy/philosophy not to use hardware based monitors.
  - Other 50% cannot justify cost of hardware monitors.

E. MARKET TRENDS

- An attempt was made to segregate user experiences with hardware and software monitors by type of hardware or system application.

- Exhibits III-8 through III-12 present these findings.

F. HARDWARE VERSUS SOFTWARE MONITOR EFFECTIVENESS

- In general, as shown in Exhibits III-13 and III-14:

  - Hardware based monitors were more effective in measuring hardware performance.

  - Software based monitors more effective in measuring software program performance.

G. DDP AND DATA COMMUNICATION TRENDS

- Respondents indicated a stronger growth in the implementation of data communications than DDP within their organizations within the next several years (46% versus 20%), as shown in Exhibits III-15 through III-18.

- The major reasons for data communications growth were.

  - Data communications was seen as an essential interim step to expand into distributed data processing.

  - Corporate expansion in the U.S. and worldwide.

EXHIBIT III-8

MARKET TRENDS - MAINFRAME MONITORS

- Large single mainframe type monitors:

  - IBM "tailgating."

RESPONDENT COMMENTS

- "Use of 'T' connectors are improving use of hardware monitors."

  - Large Commercial Bank.

- "A hardware-based monitor will tell when a channel is busy but won't tell why?"

  - DOD Chief

EXHIBIT III-9

MARKET TRENDS - PERIPHERAL MONITORS

- Peripheral type monitors:

  - Need increased emphasis on effectively applying hardware based monitors to DASD's and data base monitoring.

EXHIBIT III-10

MARKET TRENDS - TERMINAL MONITORS

- Terminal type monitors.

  - Easier to install a new data line than diagnose an obviously busy line.

RESPONDENT COMMENTS

- "Need a remote monitor to 'poll' clusters of terminals via one monitoring device." - Large Communications Company.

- "Remote monitors too expensive. That is why portable monitors are important." - DOD performance measurement Chief.

EXHIBIT III-11

MARKET TRENDS - COMMUNICATIONS MONITORS

- Communications monitors:

  - Need more access and accurate monitoring of data communication networks.

RESPONDENT COMMENTS

- "Future of hardware based monitors in data communications is a lock-step type problem. Managers are not aware of how to use information for better network planning."

  - DOD Performance Measurement Chief.

EXHIBIT III-12

MARKET TRENDS - MULTIPROCESSOR/DISTRIBUTED DATA PROCESSING MONITORS

- Multiprocessor/distributed data processing type monitors:

  - Need system to monitor IBM 4300/8100 type loops outside of host (central) computer.

RESPONDENT COMMENTS

- "Doesn't believe anyone can get into these complex DDP loops even to find out where to hook up probes."

  - Large RCS Vendor.

- "Problems definitely will not be solved by hardware-based monitors alone."

  - DOD Performance Measurement Chief.

EXHIBIT III-13

MONITOR USAGE
(NUMBER OF RESPONDENTS)

INDUSTRY / GOVERNMENT CATEGORY \ MONITOR USAGE	HARDWARE MONITORS ONLY	SOFTWARE MONITORS ONLY	BOTH	NONE
BANKING	2	1	4	
INSURANCE		1	2	
UTILITIES		1		1
TRANSPORTATION		1		
COMMUNICATION		3	1	2
DP SERVICES			2	1
HOSPITALS			1	
CONSULTANTS				1
STOCK BROKERAGE		1		
FORTUNE 1000 MANUFACTURING		4	4	
NON-FORTUNE MANUFACTURING		2	2	3
FEDERAL GOVERNMENT			2	
DEPT. OF DEFENSE	1	1	5	1
TOTALS	3	15	23	9
PERCENT TOTALS	6%	30%	46%	18%

EXHIBIT III-14

EFFECTIVENESS OF HARDWARE VERSUS SOFTWARE MONITORS

- Software monitors.
  - Market now disposed to software monitors.
  - Relatively low cost.
  - Routinely provided by mainframe vendors.
  - Narrower scope of measurements, therefore, easier to use outputs.
  - More flexible in use.
  - More applications.

EXHIBIT III-14
(continued)

EFFECTIVENESS OF HARDWARE VERSUS SOFTWARE MONITORS

- Hardware Monitors.
  - Monitors used more for diagnostics than for capacity planning.
  - COMTEN, SPECTRON seen as "competitors."
  - Avant Garde - mentioned twice.
  - Lack of "ease of use."
  - More accuracy and output than is necessary - not cost justified.
  - Getting harder to find test points.

EXHIBIT III-15

MONITOR VERSUS APPLICATION USAGE
(NUMBER OF RESPONDENTS)

MONITOR USAGE / USER TYPE	HARDWARE MONITORS ONLY	SOFTWARE MONITORS ONLY	BOTH	NONE	TOTALS
DP SYSTEMS	1	14	11	0	26
DATA COMMUNICATIONS	2	1	12	2	17
NON-USERS	-	-	-	7	7
TOTALS	3	15	23	9	50
PERCENT TOTALS	6%	30%	46%	18%	100%

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EXHIBIT III-16

TRENDS IN DATA COMMUNICATIONS
(PERCENT RESPONDING)

DATA COMMUNICATIONS TREND \ CUSTOMER STATUS	TESDATA CUSTOMERS	PROSPECTS	NEGATIVE CUSTOMERS	TOTALS
NO ANTICIPATED GROWTH		2%		2%
BEGINNING IMPLEMENTATION	6%	10%		16%
SLOW GROWTH	2%		4%	6%
UPGRADING	6%	16%	2%	24%
SIGNIFICANT GROWTH	6%	10%	6%	22%
LESS FUTURE GROWTH		4%		4%
DON'T KNOW	4%	4%	2%	10%
NO COMMENT	4%	10%	2%	16%

INF

EXHIBIT III-17

TRENDS IN DDP
(PERCENT RESPONDING)

CUSTOMER / DDP TRENDS	TESDATA CUSTOMERS	PROSPECTS	NEGATIVE CUSTOMERS	TOTALS
NO ANTICIPATED GROWTH	2%	8%	2%	12%
SLOW GROWTH	6%	12%	6%	24%
BEGINNING IMPLEMENTATION	6%	12%	2%	20%
UPGRADING	6%	2%	2%	10%
SIGNIFICANT GROWTH	4%	4%	2%	10%
DON'T KNOW		6%		6%
NO COMMENT	4%	10%	2%	16%
LESS FUTURE GROWTH		2%		2%

MOST RESPONDENTS "DON'T KNOW" HOW PERFORMANCE MEASUREMENT WILL BE IMPLEMENTED IN DDP.

EXHIBIT III-18

TREND COMPARISONS
(PERCENT RESPONDING)

USER TYPE / TREND	DC		DDP	
NO GROWTH	2		12	
SLOW GROWTH	6	12	24	38
LESS FUTURE GROWTH	4		2	
UPGRADING	24		10	
SIGNIFICANT GROWTH	22	46	10	20
BEG. IMPLEMENTATION	16		20	
DON'T KNOW	10	42	6	42
NO COMMENT	16		16	

H. REASONS FOR PURCHASING PERFORMANCE MEASUREMENT MONITORS

- Both EDP and data communications respondents indicated that their greatest reason for purchasing performance measurement monitors was to keep CPU channels and data communications lines open to internal and outside system and network users.

- Service industry sectors (banking, insurance, utilities) indicated that they had a greater need for performance measurement monitors than manufacturing companies, because their revenues were more directly tied to efficiently servicing their clients through EDP systems and data communication networks. This point is indicated in Exhibits III-19 through III-21.

I. ORGANIZATION AND STAFFING

- The data communications group was usually not an integral part of the data processing department, as shown in Exhibit III-22.

J. COMPETITION

- Tesdata equipment was mentioned most frequently by respondents to the study.

- Many respondents perceived Tesdata monitors in the same category of vendors as diagnostic equipment, as shown in Exhibit III-23.

- Overwhelmingly, most respondents used one or more forms of IBM software monitors, as shown in Exhibit III-24.

EXHIBIT III-19

REASONS FOR PURCHASING
PERFORMANCE MEASUREMENT MONITORS
EDP SYSTEM USERS

EDP SYSTEM USERS

- Keep user line open.

- Faster turnaround times.

RESPONDENT COMMENTS

- "Emphasis on performance measurement reduced because mainframe costs rapidly declining."

  - Fortune 1000 Company.

- "Don't purchase commercial monitors anymore - we build our own because our needs are more sophisticated than what market can provide."

  - Fortune 1000 Company.

- "Need more 'intelligent' monitor, but lack of management-useable information coming out of monitors makes it difficult to get management approval."

  - Fortune 1000 Company.

- "Too much money being spent on talented people for interpreting monitor output. Monitors should have auto-analysis capability built in."

  - DOD.

EXHIBIT III-20

REASONS FOR PURCHASING
PERFORMANCE MEASUREMENT MONITORS
DATA COMMUNICATION USERS

DATA COMMUNICATION USERS

- Busy lines reduce customer revenues (banks, RCS, utilities, insurance companies).

- Less expensive to install another line than trouble shoot the obvious (busy line).

- Difficult to justify high-price hardware monitor because management does not understand data communications or telecommunications.

RESPONDENT COMMENTS

- "Equipment is available if you want to spend the money."

  - Fortune 1000 Company.

EXHIBIT III-21

REASONS FOR PURCHASING
PERFORMANCE MEASUREMENT MONITORS
MISCELLANEOUS COMMENTS

- "SAS a big seller for data reduction purposes."

  - Large Communication Company

- "Vendors feigning that they can predict a major system down before it actually hits."

  - Large Commercial Bank.

- "Chairman of Board wants to use hardware monitors as a revenue forecasting tool."

  - Large RCS Vendor.

- "Tesdata has lack of understanding of application of hardware monitors in real world."

  - Nationally recognized Peformance Measurement Expert.

- "People bought Tesdata monitors in the past when there were no budget pressures. They bought "SIZZLE" and marketing/sales gimmicks. End user now aware of severe limitations of hardware monitors."

  - Nationally recognized Performance Measurement Expert.

EXHIBIT III-21
(continued)

REASONS FOR PURCHASING
PERFORMANCE MEASUREMENT MONITORS
MISCELLANEOUS COMMENTS

- "Data processing shops are getting sloppy in their additon of hardware of all types; not aware of pyramiding their monitoring problems."

  - DOD Performance Measurement Chief.

- "Uses COMTEN exclusively because of blanket contract with U.S. Government. Investigated Tesdata unit which was comparable in quality to COMTEN but much more expensive."

  - DOD Performance Measurement Chief.

- "Racal Milgo people send out their own people to diagnose more difficult performance problems on our system and do it better and faster than telephone company personnel."

  - Non-Fortune Company.

EXHIBIT III-22

STAFFING AND EXPERIENCE

STAFFING (Full Time)

- Average 5.3 people/respondent.
- Range 0-50 people for all respondents.

STAFFING (Part Time)

- Average 0.3 people/respondent.
- Range 0-3 people for all respondents.

PRIOR EXPERIENCE

- Average 5-15 years.
- Senior systems or software analyst function.

LEVEL OF TRAINING

- Mostly vendor.
- On the job training.
- Some seminar.
- User groups.

EXHIBIT III-22
(continued)

STAFFING AND EXPERIENCE

- Few in-house courses.

OBSERVATIONS

- Poor use of monitors.
- Lack of number and quality of full time staff.

USER KNOW-HOW

- Technician perplexed.
- High level, non-data processing management unaware of benefits of monitors.

RESPONSIBILITY

- Performance measurement responsibility was usually at director or above level in data processing/data communication operations.

EXHIBIT III-23

COMPETITION
HARDWARE MONITORS

MOST POPULAR COMPUTER MONITORING HARDWARE	FREQUENCY OF MENTION
TESDATA	9
DYNAPROBE	6
SPECTRON	5
RACAL MILGO	3
DATASCOPE	2
CODEX	2
QUESTRONICS	2
AVANTE GARDE	2

EXHIBIT III-24

COMPETITION

SOFTWARE MONITORS

MOST POPULAR SOFTWARE MONITORS	FREQUENCY OF MENTION
RMF, SMF, PA2	17
BOOLE AND BABBAGE	5
OMEGAMON	3
MARINO ASSOCIATES	2
CUSTOM	2

K. PRODUCT NEEDS

- Many data processing and data communication respondents indicated a need for an automated data analyzer device which would reduce their burden of statistically analyzing monitor output information and interpret this information with respect to their system or network structures.

- Most sophisticated respondents asked for some form of a "dynamic resource allocator" which would initiate a feedback response to the system or network to alleviate circuit/channel/line busy, as shown in Exhibit III-25.

EXHIBIT III-25

PRODUCT NEEDS

- Global overview of real time performance of entire system required.
- Feedback to 'dynamic resource allocator.'
- Hardware monitor portability.
- Ease of use.
- More meaningful output information for technicians and managers.
  - More usable information, not more information required.
- Better monitor multiprocessor, distributed data processing, data communication areas.

INPU

APPENDIX A: USER QUESTIONNAIRE

USER QUESTIONNAIRE

PART A

ENVIRONMENT/BACKGROUND

1a. Describe your current computer system?

CATEGORY	1981
TOTAL NUMBER OF DATA CENTERS	
CPU MAINFRAME	
COMMUNICATION SYSTEM	
DISTRIBUTED PROCESSORS	
DATA BASES	
DASDS'	

1b. What trends in DDP do you see in your company?

1c. What trends in Data Communications do you see in your company?

1d. What is the organizational relationship of your data communications group to the data processing management group?

P.M. USAGE

2. Do you or will you use any kind of performance measurement system for any of the above mentioned components now or in 1985?

( ) YES (go to question 3) ( ) NOW ( ) 1985

( ) NO (go to Part B, question 1) ( ) NOW ( ) 1985

3a. How do you expect to implement p.m. on your DDP architecture?

4. How would you rate the importance of the following uses of your computer performance measurement system? (1 = Unimportant, 5 = critical)

_____ Meeting operations schedules as planned
_____ Meeting data communication response specifications
_____ Controlling or decreasing operating costs
_____ Budgeting or planning work load more accurately
_____ Forecasting future needs
_____ Other. Describe.

5. Please describe each of the performance measurement system(s) you now have.

CATEGORY	PRODUCT ONE	PRODUCT TWO	PRODUCT THREE
a. NAME OF SUPPLIER:			
b. INDICATE WHETHER HARDWARE SYSTEM TYPE P.M. SOFTWARE TYPE SYSTEM, OR BOTH			
c. REASON FOR ACQUISITION			
d. JUSTIFICATION TO BUY PRODUCT			
e. WHERE IS IT USED?			
f. WHAT SPECIFIC INFORMATION IS MOST USEFUL?			

CATALOG NO. YES

INPUT

CATEGORY	PRODUCT ONE	PRODUCT TWO	PRODUCT THREE
g. PLEASE INDICATE YOU SATISFACTION WITH THIS PRODUCT ON A SCALE OF:			
5 = EXTREMELY SATISFIED, WOULD PURCHASE AGAIN WITHOUT HESITATION.			
0 = EXTREMELY DISSATISFIED WOULD NOT PURCHASE AGAIN.			
h. IF DISSATISFIED, WHY?			

CATALOG NO. [Y][T][E][S][ ][ ]

INP

P.M. SOFTWARE

6a. What specific things are possible with a p.m. software system that are not feasible with a p.m. hardware system?

6b. Similarly, what can be done with hardware that you cannot be done with software?

7a. How much of your host computer operating resources would you be willing to give up to obtain the benefits of the p.m. software system?

7b. Where?

_____ CPU	_____%
_____ DASD	_____%
_____ OTHER	_____%

STAFFING AND ORGANIZATION

8a. How many people are involved in performance measurement?

( ) Full Time

( ) Part Time (Percentage of time spent)

8b. What is their level of training and experience in performance measurement?

8c. Who is responsible for p.m. in data communications?

8d. Who is responsible for p.m. in DDP?

GO ON TO QUESTION 9 IF RESPONDENT IS
A FEDERAL GOVERNMENT AGENCY...
IF NOT, GO DIRECTLY TO QUESTION 10.

GOVERNMENT

9a. Does your department or agency have a Computer Resource Management Program?

( ) YES ( ) NO

9b. What type?

9c. How is it budgeted?

( ) FISCAL YEAR

( ) LONG TERM

( ) OTHER

9d. What has been the impact of fiscal policy on this computer resource management program now and in the past?

Now.

Past

BUDGET AND EXPENDITURES

10. How much will you spend on performance measurement:

In 1981 $_____

In 1985 $_____
(Give growth rates if 1985 figures unobtainable)

11. What is your total EDP budget for:

1981 _____

1985 _____

(If they won't answer:)

What proportion of your total EDP budget will be spent on performance measurement?

In 1981 _____%

In 1985 _____%

12. What proportion of your performance measurement budget is allocated to:

	1981	1985
HARDWARE	_____%	_____%
SOFTWARE	_____%	_____%
PEOPLE	_____%	_____%
OTHER (DETAIL)		
_____	_____%	_____%
	TOTAL 100%	TOTAL 100%

EFFECTIVENESS

13. Please indicate on a scale of 1-5 (1 = ineffective, 5 = very effective) the effectiveness of the p.m. monitors you are now using with the following components:

_____ Mainframe
_____ Software
_____ Data bases
_____ Communications
_____ Distributed processors
_____ Other. Describe.

MANAGEMENT DECISION MAKING

14. What is the highest level of management who sees the performance monitoring report?

15. Who in your company was the main force in developing or obtaining performance measurement systems? (Title)

PRODUCT DEVELOPMENT

16a. What new type p.m. system would you like to see available in the market?

16b. Why?

APPENDIX B: DATA COMMUNICATIONS QUESTIONNAIRE

CATALOG NO. YTES

DATA COMMUNICATIONS USER QUESTIONNAIRE

ENVIRONMENT/BACKGROUND

1a. Describe your current data communications network and operating system?

CATEGORY	1981
NUMBER OF TECHNICAL CONTROL CENTERS	
CONTROLLERS	
NUMBER OF CHANNELS/ LINES	
TYPE OF LINES	
NUMBER OF TERMINALS	
NUMBER OF SECONDARY CHANNEL UNITS	
DISTRIBUTED PROCESSORS	
SOFTWARE	

1b. What trends in DDP do you see in your company?

1c. What trends in Data Communications do you see in your company?

1d. What is the organizational relationship of your data communications group to the data processing management group?

P.M. USAGE

2. Do you or will you use any kind of performance measurement system for any of the above mentioned components now or in 1985?

( ) YES (go to question 3) ( ) NOW ( ) 1985

( ) NO (go to Part B, question 1) ( ) NOW ( ) 1985

3a. How do you expect to implement p.m. on your DDP architecture?

4. How would you rate the importance of the following uses of your data communications performance measurement system? (1 = Unimportant, 5 = critical)

_____ Meeting operations schedules as planned
_____ Meeting data communication response specifications
_____ Controlling or decreasing operating costs
_____ Budgeting or planning work load more accurately
_____ Forecasting future needs
_____ Other. Describe.

5. Please describe each of the performance measurement system(s) you now have.

CATEGORY	PRODUCT ONE	PRODUCT TWO	PRODUCT THREE
a. NAME OF SUPPLIER:			
b. INDICATE WHETHER HARDWARE SYSTEM TYPE P.M. SOFTWARE TYPE SYSTEM, OR BOTH			
c. REASON FOR ACQUISITION			
d. JUSTIFICATION TO BUY			
e. WHAT IS IT USED FOR?			
f. WHAT SPECIFIC INFORMATION IS MOST USEFUL?			

CATALOG NO. YTES

CATEGORY	PRODUCT ONE	PRODUCT TWO	PRODUCT THREE
g. PLEASE INDICATE YOU SATIS-FACTION WITH THIS PRODUCT ON A SCALE OF:			
5 = EXTREMELY SATISFIED, WOULD PURCHASE AGAIN WITHOUT HESITATION.			
0 = EXTREMELY DISSATISFIED WOULD NOT PURCHASE AGAIN.			
h. IF DISSATISFIED, WHY?			

P.M. SOFTWARE

6a. What specific things are possible with a p.m. software system that are not feasible with a p.m. hardware system in the data communications area?

6b. Similarly, what can be done with hardware that you cannot be done with software?

7a. How much of your host computer operating resources would you be willing to give up to obtain the benefits of the p.m. software system?

7b. Where?

_____ CPU _____%
_____ DASD _____%
_____ OTHER _____%

STAFFING AND ORGANIZATION

8a. How many people are involved in performance measurement in data communications?

( ) Full Time

( ) Part Time (Percentage of time spent)

8b. What is their level of training and experience in performance measurement?

8c. Who is responsible for p.m. in data communications?

8d. Who is responsible for p.m. in DDP?

GO ON TO QUESTION 9 IF RESPONDENT IS
A FEDERAL GOVERNMENT AGENCY...
IF NOT, GO DIRECTLY TO QUESTION 10.

GOVERNMENT

9a. Does your department or agency have a Computer Resource Management Program?

( ) YES ( ) NO

9b. What type?

9c. How is it budgeted?

( ) FISCAL YEAR

( ) LONG TERM

( ) OTHER

9d. What has been the impact of fiscal policy on this computer resource management program now and in the past?

Now.

Past

BUDGET AND EXPENDITURES

10. How much will you spend on performance measurement in data communications:

In 1981 $_____

In 1985 $_____
(Give growth rates if 1985 figures unobtainable)

11. What is your total data communications budget for:

1981 _____

1985 _____

(If they won't answer:)

What proportion of your total data communications budget will be spent on performance measurement?

In 1981 _____%

In 1985 _____%

12. What proportion of your performance measurement budget is allocated to:

	1981	1985
HARDWARE	_____%	_____%
SOFTWARE	_____%	_____%
PEOPLE	_____%	_____%
OTHER (DETAIL)		
_____	_____%	_____%
	TOTAL 100%	TOTAL 100%

EFFECTIVENESS

13. Please indicate on a scale of 1-5 (1 = ineffective, 5 = very effective) the effectiveness of the p.m. monitors you are now using with the following components:

_____ CPU Mainframe
_____ Software
_____ Data bases
_____ Communications
_____ Distributed processors
_____ Other. Describe.

MANAGEMENT DECISION MAKING

14. What is the highest level of management who sees the data communications performance monitoring report?

15. Who in your company was the main force in developing or obtaining data communications performance measurement systems? (Title)

PRODUCT DEVELOPMENT

16a. What new type p.m. system for data communications would you like to see available in the market?

16b. Why?

APPENDIX C: NON-USER QUESTIONNAIRE

CATALOG NO. YTES[ ][ ]

NON-USER QUESTIONNAIRE

USAGE

1a. Has anyone in your company ever investigated the use of a hardware or software performance measurement system?

( ) YES ( ) NO

1b. If so, please provide the following information.

VENDOR NAME	PRODUCT/ MODEL #	YEAR OF INVESTIGATION	TITLE OF PERSON INVESTIGATING

2a. Why wasn't the system obtained?

2b. What do you perceive to be the most important advantages of a p.m. system?

2c. Who in your company understands the use and information coming from a performance measurement system?

GO ON TO QUESTION 3 IF RESPONDENT IS
A FEDERAL GOVERNMENT AGENCY.
IF NOT, GO DIRECTLY TO QUESTION 4.

GOVERNMENT

3a. Does your department or agency have a Computer Resource Management Program?

( ) YES ( ) NO

3b. What type?

3c. How is it budgeted?

_____ Fiscal Year
_____ Long Term
_____ Other.

3d. What has been the impact of fiscal policy on this computer resource management program now and in the past?

Now.

Past

JUSTIFICATION

4. How would you justify a hardware p.m. system in your company?

BUYING MOTIVATION

5. What new development(s) (in your own computer systems' data communications network or in p.m. monitoring systems) would motivate you to become a user of a hardware p.m. monitoring system?

- Own Computer Systems

- Own Data Communications Network

- P.M. Monitoring Systems

6a. What is the probability of your becoming a user of a hardware monitoring system in the next three years?

Probability _____%

6b. When?(year)_____

6c. Why?

DECISION MAKING

7. If you became a user:

		TITLE
a.	Who would specify the requirements for the monitor?	
b.	Who would evaluate proposal?	
c.	Who would make the final buying decision?	
d.	Who would be responsible for the data accumulation & analysis	
e.	To who would this information be given?	

BUDGET

8a. How much would you spend on performance measurement?

HARDWARE	SOFTWARE
$_____ 1981	$_____ 1981
$_____ 1985 (or growth rate)	$_____ 1985 (or growth rate)

8b. What proportion would this be of your total computer hardware cost?

HARDWARE	SOFTWARE
1981 _____%	1981_____%
1985 _____%	1985_____%

DESIRED P.M. FEATURES

9. What features of p.m. monitors do you consider necessary to adequately monitor the following components:

COMPONENT	FEATURES
CPU Mainframe	
Communication	
Distributed Processors	
Data Bases	
DASDS'	
Software	